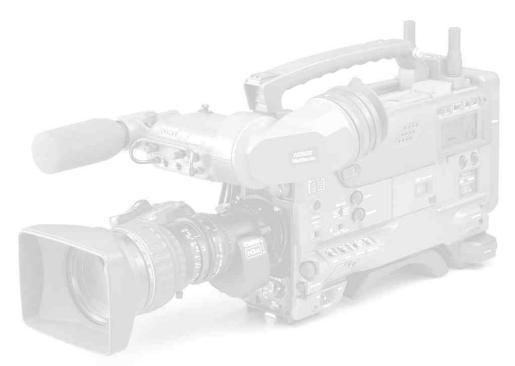# HDW-750P / 730S User Guide

V1.2

The HDW-750P is a high definition camcorder recording to the HDCAM format. It can operate in either 25P progressive scan mode, or 50i interlaced. It's designed for the European HD for TV market, but has found many other applications, from corporate to commercials and movies. The HDW-730S can operate at either 50i or 59.94i and is designed mainly for TV applications for the European or American / Japanese / 60Hz market.

This guide is designed for people using the Sony HDW-750P or HDW-730S camcorder who need some practical advice when preparing for a shoot. It's pitched at a level that will make most sense to people coming from a Digital Betacam™ background, but will hopefully still be of use to those coming from film or other formats.

As usual with these guides, the general philosophy is to record as much information as cleanly as possible to the tape. There are many ways you can change the look of your pictures in camera, but unless you're sure you're going to get exactly the final effect you want, then you're probably better spending time on lighting and composition. There are some important settings you need to get right, but after that, the '750 probably needs less 'fine tuning' than equivalent standard def. cameras.

Contents

1.0 Quick Start

If you're asked to use the '750 or '730S at short notice, and don't have the luxury of preparation time, here's a very short list of things to check to get you in the right ball park for getting sensible pictures:

- If you have a memory stick you wish to use: load a user file and an all file.
- If you don't have a memory stick, set user file and all file to 'ALL PRESET'
- If you're putting everything to all preset, after doing so, you may wish to turn on the preset matrix, set it to EBU (Std 5), and you should turn the detail level down to about –30.
- Choose a frame rate.
- Set the shutter to 50Hz if shooting at 25P.

All these operations are covered in more detail in the following sections.

2.0 Differences between 750P and 730S

In most respects the two camcorders are identical. The following are the important differences:

HDW-750P	HDW-730S
25P or 50i	50i or 59.94i
2x optical filter wheels	1 x optical filter wheel
FIT CCDs	IT CCDs
Concealed accessory connector at rear	No connector

3.0 Files and Menus

The explanation in the manuals of how the files and menus work is a little confusing to say the least. This is an attempt to clarify what happens and when.

- There are **menus**, which allow you to access and adjust a parameter.
- The values for each parameter are stored in **files**.
- There can be a value stored for a parameter in each of several **layers** of information.
- The end result can be the sum of the data values in several layers (Relative Data)
- The end result can be the value of just the top layer of data. (Absolute data)

The terminology used in the manuals is possibly the most confusing aspect. For instance the word 'USER' is applied to menus, layers and files…user menu; user file; user layer. The difference between these three terms is very important.

3.1 Menus

The access point to groups of adjustable items.

- **User Menu**
  Normally accessible whenever the camera is switched on. Stuff from any of the menus below can be added to this menu, so that it could become the only menu you need.

- **Top menu**
  This is the menu of menus…Normally when you turn the menu on, you get the user menu as described above. If you turn the menu on whilst holding the front scroll button pressed in, you get the following extra menus to pass the time with in airport departure lounges:

- **User Customize**
  This is where you go to customize the user menu described above. Here you can add and delete items to the user menu. You can create 5 pages of 10 items chosen from the menus below, plus any whole pages you like, to create your user menu.

- **Operation Menu**
  Things that affect the way switches, outputs and displays are configured. Not items that directly affect pictures, but affect the way the controls work.

- **Paint Menu**
  Picture control. 'The look'. Detail, Gamma, Knee etc. are all adjusted in this menu. Also has access to scene files to store and recall different 'looks'.

- **Maintenance Menu**
  Format switching (25P/50i) is here, plus more obscure technical stuff. Includes the things that used to be in the menu accessed via the button on the timecode panel on digital betacam camcorders.

- **File Menu**
  Save, load, store and recall all the different file types. (You can also access some files from within each individual menu. For instance you can load a lens file from within the operation menu, or from within the file menu…it's the same result.)

- **Diagnostics**
  In the unlikely event of a problem! This menu can help isolate a fault to a particular board. Also tells you software versions of the various boards in the camera, and drum running and operation hours.

- **(Service Menu)**
  Not normally accessible. You need to set internal switches to gain access to this menu.

3.2 Files:

Stored information about groups of adjustable items

- User
  Holds whatever values have been allocated to the user menu.

- User Preset
  The user file can be stored as a default setting, by moving it from the user layer to the preset layer. See layers below.

- **Scene**
  Mostly items from the paint menu. Use this as a sort of 'scratchpad' for holding picture set-ups.

- **Reference**
  Stored separately to the other files, this is only accessed during an 'auto level' operation. Auto level is a function normally associated with systems cameras, and is only accessible from RCPs designed for this kind of work, so is not really relevant to the '750. During auto level the camera reads the reference file, and copies the items held in it to the preset layer of the camera.
- **All**
  Overwrites all the user and preset layers, except for items held in the lens file. This is the one to use for matching cameras.

- **Lens**
  Shading, flare and colourimetry info specific to the lens or camera.

3.3 Layers:

Where the files are stored

- **User**
  This layer is added to the preset, service and factory layers to produce the final output of the camera. Any values you tweak via the menu are changed in this layer, and if you recall a file you will see the results here.

- **Preset**
  A default setting where you can decide what the default should be. When you hit the STD button on an RCP, or ALL PRESET in the menus, you are deleting various values held in the user layer, leaving the camera at its preset value. Use STORE USER PRESET or STORE ALL PRESET to change the default settings.

- **Service**
  Think of this as the factory reset level (though factory level is actually another layer down). If you clear the user and the preset layers, this is where you end up, as the camera came out of the box. (This is done using CLEAR ALL PRESET in the ALL FILE page of the file menu.)

- **Factory**
  What it says.

- **Memory Stick**
  You can store 100 user files, 100 scene files, 100 all files, 100 lens files and a reference file on a memory stick. That's probably enough.

3.4 File Structure

MENUS / LAYERS	USER	USER CUSTOM	OPS	PAINT	MAINT	FILE	SERVICE	DIAG.
USER	User File		All File	Scene File x5		Lens File x5		
PRESET	Preset User File			Reference File				
SERVICE								
FACTORY								
MEM. STICK	User files x100			Scene files x100		Lens files x100 All files x100 Ref file x1		

Best not to use the reference file. You can delete it using REFERENCE CLEAR, though loading an ALL file will overwrite all the values created from it. (The reference file itself is not overwritten.)

3.5 Loading Files

Load and *save* operations relate to file transfer to and from memory stick.
Store and *recall* relate to file transfer within the camera.

If you have a memory stick with setups already stored on it:

Open the side panel and insert the memory stick. The red LED will light if the memory stick is recognised.
No files are loaded until you go to the menus and tell the camera to load a file.

Press the front rotary control in, and keep it pressed while you use the toggle switch on the side of the camera to turn the menu on.
You should now see the 'TOP MENU' displayed in the viewfinder.
Turn the rotary control, and select the 'FILE MENU'
Turn the rotary control and select the 'USER FILE' page.

If you have a 'USER' file stored on your memory stick, this is probably the best one to load first.

• If you've customized the user meu it will now contain the pages you need to use, so you don't need to find the 'TOP MENU' and navigate through to the page you need.
• It will set up the camera monitoring outputs the way you want and display the menus on the downconverted composite output if required.
• It will set up the viewfinder displays the way you like to see them.
• It will configure the buttons and switches the way you like to use them.

Select 'USER FILE LOAD' and choose the file you wish to use. If you don't have a file stored, select 'USER PRESET', which returns the user menu to the factory preset settings.

Turn the rotary control and select the 'ALL FILE' page.
Loading an 'ALL' file is like wiping the slate clean before using a camera. All settings that will affect the way your pictures look will be overwritten, and you can be sure of starting from a known point. If you haven't created an 'ALL' file, then you can select the factory preset file.

Select 'LOAD ALL FILE'

If you have a suitable file on the memory stick, select and load it.

If you don't have a memory stick, and you want to clear any existing set up from the camera:
From the 'ALL FILE' page, select 'ALL PRESET'
This is the equivalent of hitting the factory reset button.

Finally, go to the 'SCENE FILE' page, and confirm that none of the check boxes next to the scene files have been selected. (Click on the scene file to de-select.)

Think of the 'ALL' file as the base level for the camcorder that you wish to start from for a particular shoot.
If you have some scene files stored on your memory stick, load them as well, but it's not essential.
Use the scene files to store adjustments and tweaks to that initial setup.
If the camera already has some scene files left in it, labelled 'Oscar Winning Cinematographer V1.0' or similar, it's probably best to ignore or overwrite them. Even if they were your files originally, they could have been modified and re-saved.

Check the camcorder is set to the correct frame rate.
Frame rate cannot be selected by loading files, as changing frame rate requires power down and power up. You can however store the frame rate you wish to use in a file, and you will get a prompt to change the frame rate during the file load process if it's not set to the one associated with the file.

If you're shooting at 25P, set the shutter to 50Hz

4.0 Camera Matching

Use the same 'ALL' file for all cameras on a multi-camera shoot.
Easiest method of keeping things colour matched is to use preset white balance and the same filter on all cameras. (Unless of course colour temperature changes during the shoot, and you want the white balance to stay the same.)
Ideally, all cameras should be checked against a reference camera, on the bench before the shoot begins (yes,yes…I know). If there is any small difference in preset colour temperature, it can then be offset electronically or VA gains can be tweaked to match.
When genlocking cameras, the '750 and '730 will read SD sync pulses in order to lock to timecode. If doing a live HD mix, then tri-level sync must be used.

5.0 Frame Rate

The HDCAM format allows for many different frame rates. With the HDW-750P, things are a little simpler, as you can record at either 25P or 50i. Put very crudely, you've got film mode and video mode.
25P will give you similar motion artefacts (flicker and blur) to film acquisition (see also the next section on use of the shutter.)
In 50i mode you will have the same motion artefacts as with Digital Betacam, but at a much higher resolution of course.
Shooting at 25P doesn't mean you're excluded from the 24P world of theatre projection and international distribution. 25P originated material can be played back 4% slow at 24P, in a kind of inverse way to a 24fps movie going through a telecine at 25fps.

The '730S also offers two frame rates: 50i and 59.94i
There's no progressive scan mode, so if you're looking for a filmic look, ideally you'd use the 750P, or F900. That's not to say you couldn't use the film effect process on 50i pictures from the 730S, in a similar way to digi-beta….but with 1080 line source material you'll get a much better result than you would with digi-beta.
The 730s has a useful advantage if working for productions coming from the NTSC world, as it can work at 59.94i (people often think of NTSC as 60Hz, but it's actually 59.94Hz)

Most HD VTRs can be set to play back at a wide range of different speeds. If for instance you've shot at 25P and you're scanning back to 24fps film, your programme duration will be 4% longer, and audio will be pitch shifted half a semitone down (though it can be electronically shifted back again and re-layed if necessary).

6.0 Shutter

Use of shutter on an HD camcorder is a little different to Digi Beta. The progressive scan mode (25P) that is the most popular mode of operation on the HDW-750, really needs to be used with the electronic shutter switched on. (Unlike Digi Beta, where it is rarely used).
In 25P mode, the camera takes 25 pictures per second (similar to a film camera) each one exposed for $1/25^{th}$ of a second. This is quite a long exposure, and results in a significant blurring of moving images. If you use the shutter to expose for only half this period (i.e. $1/50^{th}$ of a second) you get a more acceptable compromise between blur (no shutter) and flicker (fast shutter). This isn't really very surprising, as you are acquiring images in the same way as a film camera normally would, with a 180 degree mechanical shutter.
As a general rule, a shutter speed twice that of the frame rate is equivalent to a 180 degree film camera shutter and gives good results. You can still tweak the 'angle ' of your shutter if required, e.g. to eliminate flicker from 60Hz lighting, use a 60Hz shutter; or to eliminate flicker from a computer CRT monitor, use the clearscan facility.

At a frame rate of:	A film shutter angle of:	Is equivalent to:
24 fps	200 degrees	43.2 Hz
24	180	48
24	172.8	50
24	144	60
24	120	72
25	200	45
25	180	50
25	150	60
25	120	75

With software version 1.7 and above it is possible to change the display of shutter speed to angular notation.
This can be done from the service menu (see your dealer for to get this feature enabled for you.)

7.0 Gain

The gain selections available from the switch on the side of the camcorder can be programmed in the user menu just like other camcorders.
A further option, available via the service menu, is to have the gain level displayed as an ISO / ASA sensitivity rating. Useful if you're from a film background, but this feature should be used with care, as the displayed 'speed' of the camera does not take into account other factors affecting sensitivity:

- Shutter
- ND filters
- Range extender
- Transmission factor of the lens

These should all be added into the equation before attempting to expose pictures purely by using a light meter and the ASA rating of the camera.

Gain / dB	ASA
-3	440
0	630
3	880
6	1300
9	1800
12	2500
18	5000

8.0 Outputs and Monitoring

HD will not fit into a PAL monitor. Too many lines, too high line frequency. This can make things a little awkward for location monitoring and viewing.
The HDW-750P / 730S however,comes with a number of standard and optional output signals that should give you what you need.

Firstly there's an HDSDI output. HDSDI is a similar idea to the SDI signal that is the de-facto digital interchange for standard definition. It just sends a lot more bits per second. (1500 Mbps as opposed to 270Mbps for SDSDI.) Unfortunately we're going to have to get used to the fact that there are now two flavours of SDI, and they don't mix.

Use the HDSDI output to connect to an HD monitor with an HDSDI input card. This is the signal you should use for critical picture monitoring, or to send to a separate HD VTR or disk recorder for a parallel recording or copying.

HDSDI is a very high frequency signal, so it doesn't go very far down an ordinary BNC cable…about 30m maximum.

The test out BNC supplies an analog luminance (Y) HD signal that can be fed to an HD monitor with a component input. It will only show a monochrome picture, as it's only luminance, with no colour components, but you can use it to check framing or view menus.

However…most camcorders are fitted with a down-converter option, that gives you several SD monitoring options.

How do you tell if the down-converter option is fitted?
- There will be an extra BNC connector fitted in a 'bulge' in the bottom right hand corner of the side of the camcorder, pointing out of the back next to the 12V DC XLR connector.

From this connector you will be able to get either of the following, as chosen from the user menu:
- Composite PAL signal, that can be fed to any SD monitor with a composite input,
- SD SDI signal for good quality SD monitoring, or perhaps a Digi Beta

At the same time the test output can also now supply a composite video signal, so you could have for example:
- Composite video from the test output feeding floor monitors.
- SDI from the down-converter output feeding a digi beta or DVCAM offline VTR
- HDSDI feeding an HD directors monitor.

9.0 Other Options

These are the optional boards that can be fitted internally to the HDW-750P or 730S:
- HKDW-702   Down-converter for SD SDI or VBS outputs.
- HKDW-703   Cache recording for time-lapse or loop recording.
- HKDW-704   GPS support (TBA)
- HKDW-705   Slow shutter option. Up to 64 frame exposure times.

You can check which options are installed on the final page of the diagnostic menu.

10.0 Audio

Similar to Digital Betacam, but here are some points to bear in mind:

- The supplied front mic. is stereo, and uses a 5 pin XLR connection to the camera body.
- The optional internal radio mic. option is the WRR-855 model, as used previously on SX and IMX camcorders. It's a single channel diversity unit.
- There's an extra 3.5mm monitoring jack connection at the front of the camcorder.
- All those difficult to access menu items that you used to have to get to via the timecode panel on Digi Beta are now in the main camera menus, in the maintenance section.
- If you are using the HDVF-C30W colour viewfinder, there is no attachment point for the front mic. (You can use mic. mounting bracket CAC-12)

11.0 Filters

As this camera provides such a lot of natural resolution, and you've probably paid a lot of money for an HD lens, it seems kind of perverse to put softening filters in front of the lens unless there's a particular dramatic effect you're after. Otherwise internal filters are the same as Digital betacam. Alternative internal filters can be provided by Tiffen or Calmar. Contact your dealer to have them fitted.
The 750P has a dual filter wheel, the 730S having a single wheel with a mix of colour correction and ND filters.

12.0   Detail

As mentioned above, there's a lot of natural detail available, and even with the detail switched off entirely, you'll still get very good pictures. The camcorder is often used in this mode, particularly if there will be a final print to film. Leaving a small amount of detail correction in will not cause any visible ringing or overshoots on edges.

Some things to be aware of:
- The HDW-F900 and the 'HDW-750P / 730s are very different in the way the detail works. There's much less range available on the F900, and if you wind the detail up to the end stop, it still won't make the pictures very hard edged or unpleasant.
- The '750 / 730 is different. If you wind the detail right up you can get very hard edged pictures indeed.
- Beware of winding detail level down too far. Below about –50 it will start to apply negative detail, and artificially soften edges. (i.e. softer than just turning detail off.)

13.0   Matrix and gamma

- Key to the matrix and gamma curve numbers used in the paint menu:
    - EBU matrix is recommended, or ITU-709 preferred by BBC R&D.
    - Matrix off will give an acceptable but desaturated look.
    - Standard Gamma curve 4 has a high initial gain, and is useful if going through a grading process during post production.

	Matrix	Std. Gamma	Film Gamma
1	SMPTE-240M	Digi Beta (3x)	5248
2	ITU-709	MPTE 240M (4x)	5245
3	SMPTE Wide	ITU 709 (4.5x)	5293
4	NTSC	BBC (5x)	5296
5	EBU		
6	ITU-609		

14.0   Lenses

The lens mount is the standard 2/3" bayonet mount, and all the main manufacturers provide a range of HD lenses, in film style and EFP variants, plus several sets of primes. You can of course use SD lenses on HD cameras, and they'll function perfectly well. It does seem a bit like buying a very expensive hi-fi system and using some cheap speakers though.

15.1   Back focus

There is no particular problem with back focus on the '750 / 730, or the 'F900. It's a slightly more precise adjustment, because of the smaller circle of confusion of HD, but the principle is the same as SD.

16.0   Viewfinders

There are three options available:
- HDVF-20W   Monochrome tube monocular. (Flicker / blur in progressive mode can be exaggerated in the viewfinder.)
- HDVF-C30W   Colour LCD monocular (Needs version 1.70+ AT and SS software. No mounting point for front mic.)
- HDVF-C750   Colour LCD 6.5" (Useful sidemount bracket which attaches to VCT-14 tripod plate is available from Dowling Design: http://ddesign.co.uk/)

17.0   Menu List

A complete list of menu items is attached. The ops manual and volume 1 of the maintenance guide will tell you what each item does, but you may find the list useful to note down your preferred settings.
A suggestion is offered where something other than the factory preset will give good results.

Disclaimer
Whilst every effort has been made to ensure the accuracy of this document, no responsibility can be accepted for consequential loss resulting from any error contained in it. Software versions change regularly. Please check that your pictures look the way you want them to on a properly set up monitor when entering new settings.

OPERATION MENU			
01 OUTPUT SELECT			
HD SDI OUT	**on**/off		
REAR BNC OUT	**VBS**/SDI/off		
TEST OUT SELECT	HD/**SD**		
DOWN CON MODE	SQEZE /LETTR/**CROP**		SQEZE
02 FUNCTION 1			
ASSIGN SW 1	**EZ-FC**		Lens Ret
ASSIGN SW 2	**F.Mic**		VF markers
FRONT MIC SEL	Mono/**stereo**		
DF/NDF	**DF**		NDF
END SEARCH	**Off**		
LOOP/INTVL REC	**Off**		
LOOP REC TIME	1 - 8 secs (0)		
TAKE TOTAL TIME	**5min**		
REC TIME	**5sec**		
PRE LIGHTING	**Off**		
NO. OF FRAMES	**1**		
03 FUNCTION 2			
WHITE SW B	**Mem**/ATW		
SHOCKLESS WHITE	Off/**1**/2/3		3
LOW LIGHT	**Off**/on		
LOW LIGHT LEVEL	-99 to 99 (0)		
BATTERY WARNING	**10%** - 20%		
04 VF DISPLAY 1			
VF DISPLAY	**On**/off		
DISPLAY MODE	1/2/**3**		
EXTENDER	**On**/off		
FILTER	**On**/off		
WHITE	**On**/off		Off
GAIN	**On**/off		Off
SHUTTER	**On**/off		
AUDIO	**On**/off		Off
TAPE	**On**/off		Off
IRIS	**On**/off		
05 VF DISPLAY 2			
ZOOM	**On**/off		Off
COLOUR TEMP	On/**off**		
VOLT	On/**off**		
WRR RF LEVEL	On/**off**		
TIMECODE	On/**off**		
06 ! LED			
GAIN	**On**/off		
SHUTTER	**On**/off		Off
WHITE PRESET	**On**/off		Off
ATW RUN	**On**/off		
EXTENDER	**On**/off		
FILTER	**On**/off		Off
OVERRIDE	**On**/off		
07 MARKER 1			
MARKER	On/**off**		
CENTRE	On/**off**		
CENTRE MARK	1 to 4 (3)		
SAFETY ZONE	On/**off**		
SAFETY AREA	80 /**90** /92.5 / 95 %		
ASPECT	On/**off**		
ASPECT SELECT	**4:3**		
ASPECT MASK	On/**off**		
ASPECT MASK LVL	**0** to 8		
100% MARKER	On/**off**		
08 MARKER 2			
USER BOX	On / **Off**		
USER BOX WIDTH	**240**		
USER BOX HEIGHT	**135**		
USER BOX H POS	**0**		
USER BOX V POS	**0**		
09 GAIN SW			
LOW	-3 to 42dB (0)		

MID	-3 to 42dB (6)		
HIGH	-3 to 42dB (12)		
TURBO	-3 to 42dB (42)		-3dB
TURBO SW IND	On/**off**		
10 VF SETTING			
ZEBRA	On/**off**		
ZEBRA SELECT	Zebra **1**, 2 or BOTH		
ZEBRA1 DET LVL	1 to 100% (0)		0=70%
ZEBRA2 DET LVL	1 to 100% (0)		0=100%
ASPECT	**Off**		
VF DETAIL LVL	-99 to 99 (0)		
VF DETAIL H LVL	-99 to 99 (0)		
VF DETAIL V LVL	-99 to 99 (0)		
11 AUTO IRIS			
OVERRIDE	**Off**		
SPEED	**2**		
CLIP HIGH LIGHT	**Off**		
WINDOW	**1**		
WINDOW IND	**Off**		
VARIABLE WIDTH	**240**		
VARIABLE HEIGHT	**135**		
H POS	**0**		
V POS	**0**		
12 SHOT ID			
ID-1			
ID-2			
ID-3			
ID-4			
13 SHOT DISP			
DATE	On/**off**		On
TIME MODEL	On/**off**		On
MODEL NAME	On/**off**		On
SERIAL NO.	On/**off**		On
ID SELECT	On/**off**		
14 SET STATUS			
STATUS ABNORML	**On**/off		
STATUS FUNC.	**On**/off		
STATUS AUDIO	**On**/off		
15 TEST OUT			
MARKERS	On/**off**		On
VF DISPLAYS	On/**off**		On
MENUS	On/**off**		On
ZEBRA	On/**off**		
OUTPUT SELECT	**Y**/R/G/B		
16 OFFSET WHT			
OFFSET WHITE A	On/**off**		
WARM / COOL A	Kelvin reading (3200)		
COLOUR FINE A	-99 to 99 (0)		
OFFSET WHITE B	**Off**/on		
WARM / COOL B	Kelvin reading (3200)		
COLOUR FINE B	-99 to 99 (0)		
17 SHUTTER ENABLE			
ECS	**On**/off		
1/33	**On**/off		
1/50	**On**/off		
1/60	**On**/off		
1/125	**On**/off		
1/250	**On**/off		
1/500 1/1000	**On**/off		
LENS FILE SELECT	**1**		
F. ID			
F. STOP	**1.7**		

PAINT MENU		
01 SW STATUS		
GAMMA	Off/**on**	
BLACK GAMMA	**Off**/on	
MATRIX	**Off**/on	
KNEE	Off/**on**	
WHITE CLIP	Off/**on**	
DETAIL	Off/**on**	
APERTURE	Off/**on**	
FLARE	Off/**on**	
EVS	**Off**/on	
TEST SAW	**Off**/on	
02 WHITE		
COLOUR TEMP A	Temperature (3200)	
COLOUR FINE A	-99 to 99 (0)	
R GAIN A	-99 to 99 (0)	
B GAIN A	-99 to 99 (0)	
COLOUR TEMP B	Temperature (3200)	
COLOUR FINE B	-99 to 99 (0)	
R GAIN B	-99 to 99 (0)	
B GAIN B	-99 to 99 (0)	
03 BLACK		
MASTER BLACK	-99 to 99 (0)	
R BLACK	-99 to 99 (0)	
B BLACK	-99 to 99 (0)	
MASTER FLARE	-99 to 99 (0)	
R FLARE	-99 to 99 (0)	
G FLARE	-99 to 99 (0)	
B FLARE	-99 to 99 (0)	
FLARE	Off/**on**	
OUTPUT SELECT	**Y**/R/G/B	
04 GAMMA		
GAMMA	Off/**on**	
MASTER GAMMA	-99 to 99 (0)	
R GAMMA	-99 to 99 (0)	
G GAMMA	-99 to 99 (0)	
B GAMMA	-99 to 99 (0)	
OUTPUT SELECT	**Y**/R/G/B	
GAM SELECT STD	**STD**/FILM	Std
GAM SELECT FILM	1 to 4 (3)	3
05 BLK GAMMA		
BLACK GAMMA	**Off**/On	
BLK GAMMA RANGE	Low/l.mid/h.mid/**high**	
MASTER BLK GAMMA	-99 to 99 (0)	
R BLK GAMMA	-99 to 99 (0)	
G BLK GAMMA	-99 to 99 (0)	
B BLK GAMMA	-99 to 99 (0)	
OUTPUT SELECT	**Y**/R/G/B	
06 KNEE		
KNEE	Off/**on**	
KNEE POINT	50 to 109 (95)	90
KNEE SLOPE	-99 to 99 (0)	-10
KNEE SAT.	Off/**on**	
KNEE SAT LEVEL	-99 to 99 (0)	
WHITE CLIP	Off/**on**	
WHITE CLIP LEVEL	100.0 to 109.5 (105)	
07 DETAIL 1		
DETAIL	Off/**on**	
APERTURE	Off/**on**	
DETAIL LVL	-99 to 99 (0)	
APERTURE LVL	0 to 15 (0)	
H/V RATIO	-99 to 99 (0)	
CRISPENING	-99 to 99 (0)	
LEVEL DEP	Off/**on**	
LEVEL DEP LVL	-99 to 99 (0)	
DETAIL FREQ	-99 to 99 (0)	

08 DETAIL 2		
KNEE APERTURE	**<u>Off</u>**	
KNEE APT LVL	0	
DETAIL WHITE LIMIT	0	
DETAIL BLACK LIMIT	0	
DETAIL V-BLK LIMIT	0	
09 SD DETAIL		
SD DETAIL	Off/**on**	
SD DETAIL LVL	-99 to 99 (0)	-10
SD CRISPENING	-99 to 99 (0)	
SD DETAIL WHITE LIMIT	0 to 15 (0)	
SD DETAIL BLACK LIMIT	-99 to 99 (0)	
SD LEVEL DEP	-99 to 99 (0)	
SD LEVEL DEP LVL	Off/**on**	
SD DETAIL FREQ	-99 to 99 (0)	+50
SD H/V RATIO	-99 to 99 (0)	
10 SKIN DETAIL		
SKIN DETAIL ALL	**<u>Off</u>**	
SKIN DETECT		
SKIN AREA IND	**Off**	
SKIN DTL SELECT	**1**	
SKIN DETAIL	**On**	
SKIN DTL LVL	**0**	
SKIN DTL SAT	**0**	
SKIN DTL HUE	**0**	
SKIN DTL WIDTH	**40**	
11 LINEAR MATRIX		
MATRIX	**Off**/on	
MATRIX (USER)	**Off**/on	
MATRIX (PRESET)	**Off**/on	On
MATRIX (PRST SEL)	1-**2**-3-4-5-6	5
MATRIX (USER) R-G	-99 to 99 (0)	
MATRIX (USER) R-B	-99 to 99 (0)	
MATRIX (USER) G-R	-99 to 99 (0)	
MATRIX (USER) G-B	-99 to 99 (0)	
MATRIX (USER) B-R	-99 to 99 (0)	
MATRIX (USER) B-G	-99 to 99 (0)	
12 MULTI MATRIX		
MATRIX	**Off**/on	
MULTI MATRIX	**Off**/on	
AREA IND	**Off**/on	
COLOUR DETECT		
AXIS	**B**/B+/MG-/MG/ MG+/R/R+/YL-/YL+/G- /G/ /G+/CY/CY+/B-	
HUE	-99 to 99 (0)	
SATURATION	-99 to 99 (0)	
13 V MOD		
VMOD	Off/**on**	
MASTER VMOD	-99 to 99 (0)	
R VMOD	-99 to 99 (0)	
G VMOD	-99 to 99 (0)	
B VMOD	-99 to 99 (0)	
OUTPUT SELCT	**Y**/R/G/B	
14 LOW KEY SAT		
LOW KEY SAT	**Off**/on	
LEVEL	-99 to 99 (0)	
RANGE	Low/l.mid/h.mid/**high**	
Y BLK GAMMA	**Off**/on	
Y BLK GAMMA LVL	-99 to 99 (0)	
Y BLK GAMMA RANGE	Low/l.mid/h.mid/**high**	
15 SCENE FILE		
1 TO 5		
STANDARD		
SCENE RECALL		
SCENE STORE		
FILE ID		

MAINTENANCE MENU		
01 WHT SHADING		
SHADING CH SELECT	R/G/B	
OUTPUT SELECT	Y/R/G/B	
RGB WHITE H SAW	-99 to 99	
RGB WHITE H PARABOLA	-99 to 99	
RGB WHITE V SAW	-99 to 99	
RGB WHITE V PARA	-99 to 99	
WHITE SAW/PARA	Off/on	
02 BLK SHADING		
SHADING CH SELECT	R/G/B	
OUTPUT SELECT	Y/R/G/B	
RGB BLACK H SAW	-99 to 99	
RGB BLACK H PARABOLA	-99 to 99	
RGB BLACK V SAW	-99 to 99	
RGB BLACK V PARA	-99 to 99	
WHITE SAW/PARA	Off/on	
03 LEVEL ADJ	**-99 to 99**	
Y LVL	-99 to 99	
SYNC LVL	-99 to 99	
Pr LVL	-99 to 99	
Pb LVL	-99 to 99	
TEST SAW	Off/analog/digital	
OUTPUT SELECT	Y/R/G/B	
04 SD LEVEL ADJ		
SD VBS LVL	-99 to 99	
SD VBS SETUP LVL	0% / 7.5%	
SD VF Y LVL	-99 to 99	
SD VF R-Y LVL	-99 to 99	
SD VF B-Y LVL	-99 to 99	
05 BATTERY		
BEFORE END	11.0 to 13V (11.3)	
END	10%/20%/30% (11.0)	
06 VTR MODE 1	**10.5 to 11.5V**	
VIDEO OUT (F/R)	**EE**/PB	
AUDIO OUT (F/R)	**CUE**/EE	
REC AUDIO OUT	**EE**/SAVE	
CAMERA ADAPTER	**ENBLE**/DISABLE	
AUDIO CH 3/4 MODE	**CH 1/2** or SW	
REAR XLR AUTO	Off/**on**	
07 VTR MODE 2		
AU REC EMPHASIS	**Off**/on	
CUE REC	Off/**on**	
AU REF LVL	-18dB/**-20dB**	
AU REF OUT	**0dB**/+4dB/-3dB	
AU SG 1KHz	**Off**/on/auto	
MIC CH1 LVL	Side1/**front**/f+S1	
MIC CH2 LVL	Side2/**front**/f+S2	
REAR1 WRR LVL	**Side1**/front/f+S1	
REAR2 WRR LVL	**Side2**/front/f+S2	
08 VTR MODE 3		
TC OUT	**Auto**/gene	
DF/NDF	**DF**/NDF	
EXT-LK DF/NDF	**Int**/ext	
EXT-LK UBIT	**Int**/Ext	
LTC UBIT	**Fix**/time	
VITC UBIT	**Fix**/time	
WATCH AUTO ADJ	Off/**on**	
UBIT GROUP ID	**000**/101	
09 VTR MODE 4		
REC TALLY BLINK	Off/**on**	
REC START STOP	**Off**/on	
MODE SELECT	**Sel**/off/cont	
TIMER SET	**1h**/3h/8h	
STABY OFF TIMER	Off/5min/10min/30min/60min	5 min
STOP KEY FREEZE	Dsabl/frame /field	

10 VTR MODE 5		
LTC UB MARKER	**set**/all/off	
REC START MARKER	**Off**/on	
SHOT MARKER 1	**Off**/on	
SHOT MARKER 2	**Off**/on	
SHOT TIME DISP	**M**d:**hm**/dm:hm/d:hms	
11 PRESET WHITE		
COLOUR TEMP <P>	**3200**	
COLOUR FINE <P>	-99 to 99 (0)	
R GAIN <P>	-99 to 99 (0)	
B GAIN <P>	-99 to 99 (0)	
AWB ENABLE	**Off**/on	
12 DCC		
DCC FUNCTION SELECT	**DCC**/adaptive knee /fix	Fix
DCC RANGE	**600%**	
DCC POINT	-99 to 99 (0)	
DCC GAIN	-99 to 99 (0)	
DCC PEAK FILTER	0 to 3 (0)	
DCC DELAY TIME	-99 to 99 (0)	
13 AUTO IRIS 2		
IRIS WINDOW	**1**/2/3/4/5/6/ variable	
IRIS WINDOW IND	**Off**/on	
IRIS LEVEL	-99 to 99 (0)	
IRIS APL RATIO	-99 to 99 (0)	
IRIS VAR WIDTH	20 to 479 (240)	
IRIS VAR HEIGHT	20 to 269 (135)	
IRIS VAR H POS	-480 to 479 (0)	
IRIS VAR V POS	-270 to 269 (0)	
IRIS SPEED	0/1/**2**/3/4/5	
CLIP HIGH LIGHT	**Off**/on	
14 FUNCTION 3		
WHITE FILTER INH	**Off**/on	
COLOUR BAR SEL	SMPTE/100%/ 75%/ 100% (4:3) SMPTE (4:3)/ 75% (4:3)	
RM COMMON MEMORY	**Off**	
VTR STOP/START		
15 GENLOCK		
GENLOCK	Off/**on**	
RETURN VIDEO	**Off**/on	
GL H PHASE COASE	-99 to 99 (0)	
GL H PHASE FINE	-99 to 99 (0)	
16 ND COMP		
ND OFFSET ADJUST	**Off**/on	
CLEAR ND OFFSET	Exec	
17 FORMAT		
CURRENT		
NEXT	50i / 25p	

FILE MENU		
01 USER FILE		
USER FILE LOAD	Off/on	
USER FILE SAVE	Off/on	
F ID	Off/on	
USER PRESET	Off/on	
02 USER FILE 2		
STORE USER PRESET		
CLEAR USER PRESET		
CUSTOMISE RESET		
LOAD CUSTOM DATA	**Off**	
LOAD OUT OF USER	**Off**	
BEFORE FILE PAGE	**Off**	
USER LOAD WHITE	**Off**	
03 ALL FILE		
ALL FILE LOAD		
ALL FILE SAVE		
F ID		
ALL PRESET		
STORE ALL PRESET		
CLEAR ALL PRESET		
3SEC CLR PRESET	**Off**	
04 SCENE FILE		
1		
2		
3		
4		
5		
STANDARD		
SCENE RECALL		
SCENE STORE		
F ID		
05 REFERENCE FILE		
REFERENCE STORE		
REFERENCE CLEAR		
REFERENCE LOAD		
REFERENCE SAVE		
F ID		
SCENE WHITE DATA	**Off**	
06 LENS FILE 1		
LENS FILE RECALL		
LENS FILE STORE		
F ID		
F STOP	**1.7**	
LENS NO OFFSET		
SOURCE MEMORY		
07 LENS FILE 2		
LENS M V MOD	-99 to 99 (0)	
LENS CENTRE H	-480 to 479 (0)	
LENS CENTRE V	-270 to 269 (0)	
OUTPUT SELECT	**Y**/R/G/B	
LENS R FLARE	-99 to 99 (0)	
LENS G FLARE	-99 to 99 (0)	
LENS B FLARE	-99 to 99 (0)	
LENS W-R OFSET	-99 to 99 (0)	
LENS W-B OFSET	-99 to 99 (0)	
08 LENS FILE 3		
SHADING CH SEL	**R**/G/B	
OUTPUT SEL	**Y**/R/G/B	
LENS RGB H SAW	-99 to 99 (0)	
LENS RGB H PARA	-99 to 99 (0)	
LENS RGB V SAW	-99 to 99 (0)	
LENS RGB V PARA	-99 to 99 (0)	
09 MEMORY STICK		
FORMAT	Off/user/all/ scene/lens refer	
MS IN > JUMP TO		

10 TELEFILE		
TELEFILE CLEAR		
DIAGNOSTICS MENU		
01 HOURS METER		
RESET METER		
DRUM RUNNING		
TAPE RUNNING		
OPERATION		
THREADING		
DRUM RUNNING 2		
TAPE RUNNING 2		
OPERATION 2		
THREADING 2		
02 TIME / DATE		
ADJUST		
HOUR		
MIN		
SEC		
YEAR		
MONTH		
DAY		
03 ROM VERSION		
AT VER: XXX		
SS VER: XXX		
FP VER: XXX		
EQ VER: XXX		
04 DEV STATUS		
I/O EEPROM LSI		
05 OPTION BOARD		
DOWN CONVERTER		
HD SDI OUTPUT		
PICTURE CACHE		
SLOW SHUTTER		